Space Weather Forecast

Issued on Friday, 24 November 2023 at 13:08 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: R1-R2 Radio Blackouts likely throughout. Chance of Minor Geomagnetic Storms, days 2-3 (25-26 Nov).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with a single low-level Moderate flare from a sunspot near the central disc. There are currently twelve sunspot groups on the visible disc, the majority of which are located in the eastern solar hemisphere. The largest group is now a magnetically complex region in the southeast, but there also is a large cluster of various sunspot groups in the northeast that appear to be magnetically connected.

There appears to be a possible CME associated with the single moderate flare from the sunspot near central disc, but further imagery will be required in order to analyse if earth directed.

Solar Wind / Geomagnetic Activity: Solar wind parameters have been indicative of a waning connection to a coronal hole, with wind speeds having fallen from slightly elevated to background levels. The interplanetary magnetic field has been at weak levels, but on a declining trend. The important north-south component has varied weakly. Resultant geomagnetic activity was quiet throughout the 24 hour period.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate with further isolated Moderate class flares likely and a slight chance of isolated Strong flares mainly from current eastern solar hemisphere sunspot regions. Despite this the recent moderate flare was from a relatively magnetically simple area near centre disc.

Solar Winds / Geomagnetic Activity: Two Earth-directed CMEs have been analysed and modelled, likely arriving at Earth days 1-2 (24-25 Nov) and day 2-3 (25-26 Nov). A further CME looks to have taken place associated with the moderate flare from centre disc but further imagery will be required before this can be analysed.

Solar winds are now at background levels. No further coronal hole enhancements are expected until the arrival of CH75/+ later on day 3 (26 Nov), with speeds of up to 500-550 km/s possible.

Geomagnetic Activity will be mainly Quiet today (24th Nov), with a chance of isolated Unsettled intervals. Activity should then increase to Active to Minor Storm levels with the arrival of the first CME. This is most likely to occur early tomorrow (25 Nov), but with a slight chance of occurring late today (24 Nov). With any Minor geomagnetic storm activity, under clear skies, aurora may be visible across northern Scotland. Activity is expected to temporarily ease to Unsettled, then increase once again to mainly Active to Minor Storm levels later tomorrow (25 Nov) into day 3 (26 Nov) given combined coronal hole and CME influences. Day 4 (27th) Unsettled to Active (Kp 3-4) activity is expected.

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	50	50	20
Strong	G3	No	1	5	5	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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